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Energy policies needed to transition to a green economy based on high-accuracy forecasts

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Renewable energy (including bioenergy) is a key for economic developmental consistency and supply is necessary for keeping countries on a sustained growth path. In order to minimize cost due to over (excess supply) and/or under supply (shortage), policymakers and stakeholders leverage on business-as-usual (BAU) energy demand projections as benchmarks to design and implement efficient policies. Existing high-profile energy demand forecasting models (such as NEMS) achieve relatively high accuracies for short- and medium-term projections but records high forecast inaccuracies when utilized for long term cases due to the massive assumption dependent explanatory variables whose assumptions often deviate from realized levels but are pivotal to the core forecasting modules. Here, we implement a relatively high-accuracy level, trend and seasonality consistent technique that is devoid of assumption driven variables for BAU long-term energy demand forecasting. We utilize the technique to forecast bioenergy and total primary energy supply in the USA. The results suggest that for the 2012-2016 five-year forecast, the accuracy of the proposed technique strikingly outperform the regression and double exponential smoothing (DES) benchmark models and record significant improvement up to ~10- fold on NEMS related reference case forecast as reported in Annual Energy Outlook 2011 (AEO2011) and AEO2012. Outputs from applying the proposed high-accuracy technique for long-term production and consumption projections show that total renewable energies will account for ~15.77% out of the expected ~101.75 quadrillion Btu total primary energy consumption in 2035; thus radical and revolutionary energy policies are required for USA to achieve the '100% renewables by 2035' target approved by the U.S. Conference of Mayors in June 2017.

Biography

Amos Oppong is a Doctoral Researcher at the School of Management and Economics (SME) of the University of Electronic Science and Technology of China (UESTC), and a Member of the International Association of Energy Economists (IAEE). He specializes in environmental, energy and economic modelling and forecasting.

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